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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/525,714	12/08/2005	Yuji Segawa	450100-04734	5948

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EXAMINER	
BHAT, NARAYAN KAMESHWAR	
ART UNIT	PAPER NUMBER
1634	

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12/06/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/525,714	SEGAWA ET AL.	
	Examiner	Art Unit	
	Narayan K. Bhat	1634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 September 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) *22,23 and 31* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21 and 24-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 February 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *2/18/2005, 11/02/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Claims 1-31 are pending in this application.

2. Applicant's election of Group I invention, claims 1-21 and 24-30, in the reply filed on September 13, 2007 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

3. Claims 22, 23 and 31 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention of Group II there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on September 13, 2007.

4. The examiner for this application has changed. Please address future correspondence to Examiner Narayan K. Bhat, Art Unit 1634.

35 USC § 112 Sixth Paragraph

5. The following is a quotation of the sixth paragraph of 35 U.S.C. 112:

> An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

6. The limitation "means for dielectrophoresis of the nucleotide probes stretched by the counter electrodes toward a pair of the adjacent scanning electrodes by a non-uniform electric field" in claim 3, is not being treated under 35 USC 112, sixth paragraph because, it does not meet the third criteria of the 3-prog analysis, viz., the claim

language is modified by sufficient structure for achieving the function, i.e., immobilizing the nucleotide probes in a stretched form so as to bridge the adjacent scanning electrodes.

7. The limitation "means for generating electric fields" in claims, 8, 14 and 18, is being treated under 35 USC 112, sixth paragraph as being limited to switching on and off of an array of scanning electrodes arranged on the chip, which is the "means for generating electric fields" as recited in the instant specification (USPGPUB, paragraph 0014) or functional equivalents of scanning electrodes.

8. The limitation "means for immobilizing the nucleotide probes in a stretched form" in claim 18, is not being treated under 35 USC 112, sixth paragraph because, it does not meet the third criteria of the 3-prog analysis, viz., the claim language is modified by sufficient structure for achieving the function, i.e., immobilizing the nucleotide probes in a stretched form is done by sequentially applying voltage between the adjacent scanning electrodes.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section

351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

10. Claims 1-2 are rejected under 35 U.S.C. 102(b) as being anticipated by Sato et al (USPN 6,582,954 issued June 23, 2003).

Regarding claim 1, Sato et al teaches explicitly a pair of opposing electrodes (Fig. 4, # 22 and 23) and probes immobilized on the electrode 22 (Fig. 4, # 66) and a solution reservoir region 24 (Fig. 4, # 24), i.e., reaction region, and by generating electric filed between the electrodes by a power supply (Fig. 1, # 10) to extend the DNA probes and the sample DNA in the reaction region (Fig. 4c, columns 5 and 6, lines 44-67 and 1-40), thus providing a configuration for stretching the nucleotide probes by an electric filed and immobilizing the probes in a stretched form. Sato et al teaches the electrode, and a power supply unit for supplying AC power (Fig. 1, # 10) and a means for generating electric field (column 2, lines 53-67) capable of generating a non-uniform electric field for dielectrophoresis as defined in the instant specification (paragraph 0037, claim 7). Thus teachings of Sato et al anticipate the claim.

Regarding claim 2, Sato et al teaches the electrode (Fig. 4, # 22 and 23), i.e., substrate, a reaction region (Fig. 4, # 24) and a measuring unit connected to the surface of the electrode to detect the presence of the target in a sample (Fig. 1, # 40, column 4, lines 13-40) and therefore is the sensor chip of said claim as defined in the instant specification (paragraph 0041).

11. Claims 24-28 and 30 are rejected under 35 U.S.C. 102(e) as being anticipated by Zenhausern et al (USPGPUB NO. US 2004/0011650 filed Jul. 22, 2002).

Regarding claim 24, Zenhausern et al teaches a device that includes a channel (Fig. 2, # 400, paragraphs 0014 and 0252), i.e., a reaction region for hybridization between nucleotide probes and target nucleotide sequences having a base sequence complementary to the nucleotide probes and further teaches field generating electrodes, i.e., counter electrodes disposed in the reaction region (Fig. 3, # 510, paragraph 0254) and explicitly teaches floating electrodes i.e., floating-potential electrodes being dispersed between the counter electrodes (Fig. 3, #s 501-505, paragraph 0254, Fig. 4, dielectrophoretic electrode # 530, Floating electrode # 531).

Regarding claim 25, Zenhausern et al teaches that the floating-potential electrodes have a shape (Fig. 4, # 531) being capable of generating a non-uniform electric field (paragraphs 0014, 0059 and 0252).

Regarding claim 26, Zenhausern et al teaches that the field generating electrodes, i.e., counter electrodes have dimensions in millimeters (paragraph 0055) and floating electrodes have dimensions in micrometers (paragraph 0254) thus teaching each surface of the floating-potential electrodes is smaller than that of the counter electrodes.

Regarding claim 27, Zenhausern et al teaches that the surfaces of the floating-potential electrodes are treated for immobilizing the nucleotides probes (paragraph 0254).

Regarding claim 28, Zenhausern et al teaches that the field generating electrodes, i.e., counter electrodes are aligned in parallel with each other (Fig. 2, #s 420 and 421, paragraph 0252).

Regarding claim 30, Zenhausern et al teaches a device that include field generating electrodes and floating electrodes and a channel (Fig. 3, paragraph 0254) for manipulating analytes via dielectrophoresis and detecting target analytes (paragraph 0014) thus teaching a sensor chip comprising the hybridization detector.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

14. Claims 1-21, 24 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zenhausern et al (USPGPUB NO. US 2004/0011650 filed Jul. 22, 2002) in view of Sato et al (USPN 6,582,954 issued June 23, 2003).

Regarding claim 1, Zenhausern et al teaches a device, that includes a channel (Fig. 2, # 400, paragraphs 0014 and 0252), i.e., a reaction region for hybridization between nucleotide probes and target nucleotide sequences having a base sequence complementary to the nucleotide probes. It is noted that the hybridization between nucleotide probes and target nucleotide sequences is the recitation of the intended use of the reaction region.

Zenhausern et al also teaches channel has field generating electrodes (Fig. 2, # 420 and 421, paragraphs 0014 and 0252), floating electrodes comprising capture probes (Fig. 2, # 430, paragraphs 0014 and 0252) and a power source (paragraph 0014) for dielectrophoresis (paragraph 0015), thus teaching the reaction region has a configuration for manipulating analytes by an electric field by dielectrophoresis on scanning electrodes in the reaction region. The floating electrode of Zenhausern et al is the scanning electrode of the instant claim.

Regarding claim 2, Zenhausern et al teaches a device for manipulating analytes via dielectrophoresis and detecting target analytes (paragraph 0014) thus teaching a sensor chip comprising the hybridization detector.

Regarding claim 3, Zenhausern et al teaches a device that includes a channel (Fig. 2, # 400, paragraphs 0014 and 0252), i.e., a reaction region for hybridization between nucleotide probes and target nucleotide sequences having a base sequence complementary to the nucleotide probes.

Zenhausern et al also teaches field generating electrodes (Fig. 2, # 420 and 421, paragraphs 0014 and 0252), i.e., counter electrodes for generating an electric field and

further teaches a plurality of floating electrodes comprising capture probes in the reaction region (Fig. 2, # 430, paragraphs 0014 and 0252), i.e., scanning electrodes arrayed in the reaction region the electrodes being capable of being energized. Zenhausern et al further teaches a power source for generating asymmetrical, oscillating electric field to manipulate analytes by dielectrophoresis (Figs. 3 and 4, paragraphs 0014-0015, 0024-0026, 0052-0059 and 0252-0254) thus teaching a means for dielectrophoresis for trapping analytes at the adjacent scanning electrodes by a non-uniform electric field generated by applying a voltage between the adjacent scanning electrodes.

Regarding claim 4, Zenhausern et al teaches a device for manipulating analytes via dielectrophoresis and detecting target analytes (paragraph 0014), i.e., a sensor chip for its intended use, wherein target nucleotide sequences are hybridized to the nucleotide probes immobilized between the scanning electrodes by dielectrophoresis of the target nucleotide sequences stretched in the electric field toward the scanning electrodes (paragraphs 0014-0015 and 0024-0026).

Regarding claim 5, Zenhausern et al teaches that the floating electrodes, i.e., scanning electrodes have polygonal ends (paragraphs 0055 and 0252).

Regarding claim 6, Zenhausern et al teaches that the field generating electrodes, i.e., counter electrodes are disposed upstream and downstream of the reaction region, i.e., to oppose and be in parallel with each other (Fig. 2, Filed electrodes #s 420 and 421, paragraph 0252).

Regarding claim 8, Zenhausern et al teaches a device that includes a channel (Fig. 2, # 400, paragraphs 0014 and 0252), i.e., a reaction region for hybridization between nucleotide probes and target nucleotide sequences having a base sequence complementary to the nucleotide probes.

Zenhausern et al also teaches a field generating electrode, i.e., a common electrode disposed in the reaction region (Fig. 3, # 510, paragraph 0254) and further teaches floating electrodes, i.e., scanning electrodes formed of a plurality of electrodes aligned in parallel (Fig. 3, #s 501-505, Also see Fig. 4, paragraph 0254).

Zenhausern et al also teaches a power source (paragraphs 0014, 0270) and an AC voltage (paragraph 0254) as a means for generating electric fields by sequentially applying a voltage between the common electrode and each of the scanning electrodes, dielectrophoresis of the nucleotide probes in the reaction region toward the energized scanning electrodes (paragraphs 0254 and 0270).

Regarding claim 9, Zenhausern et al teaches a field generating electrode, i.e., a common electrode (Fig. 3, #510) and the floating electrodes, i.e., scanning electrodes (Fig. 3, # 501), wherein the scanning electrodes are aligned in two lines so that each end of the scanning electrodes opposes each other (Fig. 4, scanning electrodes # 530 and 531, paragraph 0254).

Regarding claim 10, Zenhausern et al teaches a plurality of scanning electrodes are disposed so that the distances between the opposing scanning electrodes increase stepwise in the direction that a voltage is sequentially applied (paragraphs 0065 and 0254).

Regarding claim 11, Zenhausern et al teaches a device for manipulating analytes via dielectrophoresis and detecting target analytes (paragraph 0014), i.e., a sensor chip for its intended use, wherein target nucleotide sequences are hybridized to the nucleotide probes immobilized between the scanning electrodes by dielectrophoresis of the target nucleotide sequences stretched in the electric field toward the scanning electrodes (paragraphs 0014-0015 and 0024-0026).

Regarding claim 12, Zenhausern et al teaches that the floating electrodes, i.e., scanning electrodes have polygonal ends (paragraphs 0055 and 0252).

Regarding claim 14, Zenhausern et al teaches a device that includes a channel (Fig. 2, # 400, paragraphs 0014 and 0252), i.e., a reaction region for hybridization between nucleotide probes and target nucleotide sequences having a base sequence complementary to the nucleotide probes.

Zenhausern et al also teaches a plurality of floating electrodes (Fig. 3, #s 501-505, and paragraph 0254), i.e., first scanning electrodes arrayed in the reaction region; second scanning electrodes arrayed so that the ends of the second scanning electrodes oppose the respective ends of the first scanning electrodes (Fig. 4, #s 530 and 531, paragraph 0254 and 272) and further teaches a power source (paragraphs 0014, 0270) and an AC voltage (paragraph 0254) as a means for generating electric fields by sequentially applying a voltage between the adjacent electrodes of the first scanning electrodes and between the adjacent electrodes of the second scanning electrodes, dielectrophoresis of the nucleotide probes toward the energized scanning electrodes (paragraph 0272).

Regarding claim 15, Zenhausern et al teaches a device for manipulating analytes via dielectrophoresis and detecting target analytes (paragraph 0014), i.e., a sensor chip for its intended use, wherein target nucleotide sequences are hybridized to the nucleotide probes immobilized between the scanning electrodes by dielectrophoresis of the target nucleotide sequences stretched in the electric field toward the scanning electrodes (paragraphs 0014-0015 and 0024-0026).

Regarding claim 16, Zenhausern et al teaches that the floating electrodes, i.e., scanning electrodes have polygonal ends (paragraphs 0055 and 0252).

Regarding claim 18, Zenhausern et al teaches a device that includes a channel (Fig. 2, # 400, paragraphs 0014 and 0252), i.e., a reaction region for hybridization between nucleotide probes and target nucleotide sequences having a base sequence complementary to the nucleotide probes and further teaches a field generating electrode, i.e., a common electrode disposed in the reaction region (Fig. 3, # 510) and a plurality of floating electrodes (Fig. 3, #s 501-505, paragraph 0254), i.e., scanning electrodes arrayed so that the ends of the scanning electrodes oppose the common electrode.

Zenhausern et al also teaches a power source (paragraphs 0014, 0270) and an AC voltage (paragraph 0254) as a means for generating electric fields by sequentially applying a voltage between the common electrode and each electrode of the scanning electrodes and for dielectrophoresis of the nucleotide probes toward the energized scanning electrodes.

Regarding claim 19, Zenhausern et al teaches a device for manipulating analytes via dielectrophoresis and detecting target analytes (paragraph 0014), i.e., a sensor chip for its intended use, wherein target nucleotide sequences are hybridized to the nucleotide probes immobilized between the scanning electrodes by dielectrophoresis of the target nucleotide sequences stretched in the electric field toward the scanning electrodes (paragraphs 0014-0015 and 0024-0026).

Regarding claim 20, Zenhausern et al teaches that the floating electrodes, i.e., scanning electrodes have polygonal ends (paragraphs 0055 and 0252).

Regarding claim 24, Zenhausern et al teaches a device that includes a channel (Fig. 2, # 400, paragraphs 0014 and 0252), i.e., a reaction region for hybridization between nucleotide probes and target nucleotide sequences having a base sequence complementary to the nucleotide probes and further teaches field generating electrodes, i.e., counter electrodes disposed in the reaction region (Fig. 3, # 510, paragraph 0254) and explicitly teaches floating electrodes i.e., floating-potential electrodes being dispersed between the counter electrodes (Fig. 3, #s 501-505, paragraph 0254, Fig. 4, dielectrophoretic electrode # 530, Floating electrode # 531).

Regarding claim 1, Zenhausern et al do not teach a reaction region having a configuration for stretching nucleotide probes by an electric field. Regarding claims 3, 8, 14 and 18 Zenhausern et al teaches immobilizing the probes on the floating electrodes, i.e., scanning electrodes but silent about probes in stretched form. However, reaction region having a configuration for stretching nucleotide probes by an electric field was known in the art at the time of the invention was made as taught by Sato et al, who

teaches explicitly a pair of opposing electrodes (Fig. 4, # 22 and 23) and probes immobilized on the electrode 22 (Fig. 4, # 66) and a solution reservoir region 24 (Fig. 4, # 24), i.e., reaction region, and by generating electric filed between the electrodes by a power supply (Fig. 1, # 10) to extend the DNA probes and the sample DNA in the reaction region (Fig. 4c, columns 5 and 6, lines 44-67 and 1-40), thus providing a configuration for stretching the nucleotide probes by an electric filed and immobilizing the probes in a stretched form. Sato et al further teaches determining the base length, concentration, rate of hybridization and the amount of hybridization between a target and probe in a sample at a time (Figs. 5 and 7, columns 6-8).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the reaction region configuration of Zenhausern et al to include the reaction region configuration of Sato et al with the expected benefit of determining the base length, concentration, rate of hybridization and the amount of hybridization between a target and probe in a sample at a time as taught by Sato et al (Figs. 5 and 7, columns 6-8) thus acquiring more information about the sample with the device of Zenhausern et al.

Regarding claims 7, 13, 17, 21 and 29 Zenhausern et al teaches the AC current (paragraphs 0212 and 0246) but silent about generating electric field by alternating current. However the electric field generation by alternating current was known at the time of the invention made as taught by Sato et al, who teaches AC power supply (Fig. 1, # 12) and computer (Fig. 1, # 50) a means for generating electric field by alternate current. Sato et al further teaches that electric field generated by alternate current

provides a means for attaching and detaching nucleic acids on the electrode and manipulating nucleic acids in the reaction region (Figs. 3a and b, column 5, lines 4-20).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the electric field generation of Zenhausern et al to include the electric field generation by alternated current of Sato et al with the expected benefit of attaching and detaching nucleic acids on the electrode and manipulating nucleic acids in the reaction region as taught by Sato et al (Figs. 3a and b, column 5, lines 4-20).

Double Patenting

15. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

16. Claims 1-7 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-12 of copending Application No. 11/221,940 in view of Sato etal. Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following reasons.

Regarding instant claim 1, the claims 1-2, 4 and 5 of the '940 copending application are drawn to a hybridization detecting unit comprising a reaction region (claim 1), a common electrode (claim 5) and a plurality of opposing electrodes with immobilized probe (claim 4) to detect the target nucleic acid by moving target nucleic acid sequentially by dielectrophoresis (claim 1). The claims of 940 copending application are not drawn to a configuration for stretching nucleotide probes by an electric field. However, reaction region having a configuration for stretching nucleotide probes by an electric field was known in the art at the time of the invention was made as taught by Sato et al, who teaches explicitly a pair of opposing electrodes (Fig. 4, # 22 and 23) and probes immobilized on the electrode 22 (Fig. 4, # 66) and a solution reservoir region 24 (Fig. 4, # 24), i.e., reaction region, and by generating electric filed between the electrodes by a power supply (Fig. 1, # 10) to extend the DNA probes and the sample DNA in the reaction region (Fig. 4c, columns 5 and 6, lines 44-67 and 1-40), thus providing a configuration for stretching the nucleotide probes by an electric filed and immobilizing the probes in a stretched form. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the reaction region configuration of stretching nucleotide probes by an electric field to include the reaction region configuration of Sato et al with the expected benefit of

determining the base length, concentration, rate of hybridization and the amount of hybridization between a target and probe in a sample at a time as taught by Sato et al (Figs. 5 and 7, columns 6-8). Claims 2-7 of the instant application are obvious over claims 2-12 of the '940 copending application in view of Sato et al.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

17. Claims 1-7 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-11 of copending Application No. 11/145,977 in view of Sato etal. Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following reasons.

Regarding instant claim 1, the claims 1 and of the '977 copending application are drawn to a hybridization detecting unit comprising a reaction region (claim 1), opposed electrodes disposed so that electric field can be applied to the medium in the reaction region and power supply (claim 1) to move the nucleic acids to the electrode and a probe on the electrode (claim 2). The claims of 977 copending application are not drawn to a configuration for stretching nucleotide probes by an electric field. However, reaction region having a configuration for stretching nucleotide probes by an electric field was known in the art at the time of the invention was made as taught by Sato et al, who teaches explicitly a pair of opposing electrodes (Fig. 4, # 22 and 23) and probes immobilized on the electrode 22 (Fig. 4, # 66) and a solution reservoir region 24 (Fig. 4, # 24), i.e., reaction region, and by generating electric filed between the electrodes by a

power supply (Fig. 1, # 10) to extend the DNA probes and the sample DNA in the reaction region (Fig. 4c, columns 5 and 6, lines 44-67 and 1-40), thus providing a configuration for stretching the nucleotide probes by an electric filed and immobilizing the probes in a stretched form. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the reaction region configuration of stretching nucleotide probes by an electric field to include the reaction region configuration of Sato et al with the expected benefit of determining the base length, concentration, rate of hybridization and the amount of hybridization between a target and probe in a sample at a time as taught by Sato et al (Figs. 5 and 7, columns 6-8). Claims 2-7 of the instant application are obvious over claims 2-11 of the '977 copending application in view of Sato et al.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

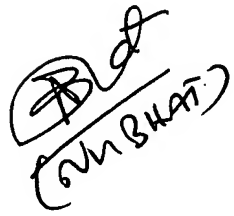
Conclusion

18. No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Narayan K. Bhat whose telephone number is (571)-272-5540. The examiner can normally be reached on 8.30 am to 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ram R. Shukla can be reached on (571)-272-0735. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

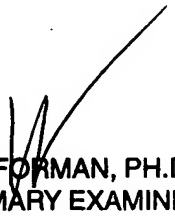
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Narayan K. Bhat, Ph. D.

Examiner

Art Unit 1634



BJ FORMAN, PH.D.
PRIMARY EXAMINER